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ABSTRACT

The Dominant Characteristics Inventory (DCI) was administered to 836 university undergraduates, 666 college professors of mathematics, chemistry, English, modern foreign languages, history, and physical education, and 752 high school teachers of the same subjects. Data from the college students were used to assess the reliability and validity of the DCI and the comparability of male and female responses to its traits. College professor data were used to establish worker profiles to which high school teacher profiles were compared. It was established that the DCI traits are reliable and valid; males and females respond to them similarly; workers from an occupational group respond similarly; there are basic similarities between the responses to DCI traits by workers who perform at different levels within an occupational group, regardless of race; and fifty satisfied workers can produce a reliable profile for an occupational group. Two other inventories which use DCI variables (traits) or activity statements--the Dominant Characteristics Inventory-Secondary Level and the Preferred Activities Inventory (PAI)--were administered to adolescents and children, respectively, to determine how early in a person's life the DCI traits are recognizable. It was determined that pre-school children can respond meaningfully to the activity statements of the PAI and parents confirm their preferences. (Author/JH)

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Final Report

Project No. 498AH70239
Grant No. G007702244

Changing Sex-Role Stereotyping and Sex Bias -- A Vocational Education Project

Dr. Franklin D. Westbrook

University Counseling Center
University of Maryland
College Park, Maryland

June 1, 1979

The research reported herein was performed pursuant to a grant with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the Project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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Counseling Center

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1979

Three typographical errors which could cause a misunderstanding of the contents of the report are:

1) Page 5, line 9 should read, "...possible to treat them as distances from a well defined point...."

2) Page 6, paragraph 3, sentence 1 should read, "Approximately 17 (16.6%) matches were expected by chance."

This research was sponsored by the Department of Health, Education, and Welfare, Office of Education. The University of Maryland consultants were Drs. Thomas M. Magoon, William E. Sedlacek, Janice M. Birk, and Yvonne O. McMullan.

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Changing Sex-Role Stereotyping and Sex Bias--

A Vocational Education Project

Franklin D. Westbrook

Research Report #15-79

Summary

The Dominant Characteristics Inventory (DCI) was administered to 836 university undergraduates, 666 college professors of mathematics, chemistry, English, modern foreign languages, history, and physical education, and 752 high school teachers of the same subjects. The undergraduates were enrolled at the University of Maryland; the college professors were employed at public colleges anduniversities within the 50 states and the District of Columbia; and the high school teachers were employed in public school systems in 10 cities across the nation.

The DCI variables attained acceptable levels of reliability as determined by and analysis of test-retest data collected over a 10 week interval. They were also found to be valid in terms of the percentage of theoretical matches with Holland's Self Directed Search. Males and females within the worker samples were compared. Overall there were strong similarities between the responses of males and females on the DCI, however, a significant number of differences were observed between male and female, high school teachers of modern foreign languages and physical education. Possible explanation were offered for these differences.

Two other inventories which use DCI variables (traits) or activity statements--the Dominant Characteristics Inventory-Secondary Level and the Preferred Activities Inventory--were administered to adolescents and children, respectively, to determine how early in a person's life the DCI traits are recognizable. It was determined that pre-school children can respond meaningfully to the activity statements of the PAI and parents confirm their preferences.

PROJECT NUMBER: 498AH70239 Grant Number: G007702244

TITLE OF PROJECT: Changing Sex-Role Stereotyping and Sex Bias--A Vocational Education Project

GRANTEE ORGANIZATION: University Counseling Center, Shoemaker Building
University of Maryland, College Park, Maryland 20742

PROJECT DIRECTOR: Dr. Franklin D. Westbrook

PERIOD COVERED: From September 1, 1977 to June 1, 1979

ACCOMPLISHMENTS: The Dominant Characteristics Inventory (DCI, 1977) was administered to 836 university undergraduates, 666 college professors of mathematics, chemistry, English, modern foreign languages, history, and physical education, and 752 high school teachers of the same subjects. The undergraduates were enrolled at the University of Maryland; the college professors were employed at public colleges and universities within the 50 states of the United States and the District of Columbia; and the high school teachers were employed in public school systems in Washington, D.C., Baltimore and Frederick, Maryland, Miami, Florida, Houston, Texas, Portland, Oregon, Chicago, Illinois, and Albany, Syracuse, and Rochester, New York.

Data from the college students were used to assess the reliability and validity of the DCI and the comparability of male and female responses to its traits. College professor data were used to establish worker profiles to which high school teacher profiles were compared. It was established that: the DCI traits are reliable and valid; males and females respond to them similarly; workers from an occupational group respond similarly; there are basic similarities between the responses to DCI traits by workers who perform at different levels within an occupational group, regardless of race; and 50 satisfied workers can produce a reliable profile for an occupational group.

In order to determine at what level DCI traits become recognizable as personal descriptors, two abbreviated versions of the DCI were developed — the Dominant Characteristics Inventory--Secondary Level (DCI--SL, 1977) for adolescents and the Preferred Activities Inventory (PAI, 1977) for children. The results of the various administrations showed that the traits are recognizable as personal descriptors at both levels and by mothers of children as young as 2½ years old. They also show that sex role stereotyping has its beginnings in childhood.

The funded portion of the Sex-Role Stereotyping research project ended February 28, 1979, at which time summary results were sent to 850 participants and supporters of the project. Approximately 50 persons have requested and will be sent the final report.

SEX ROLE STEREOTYPING AND SEX BIAS RESEARCH PROJECT

Franklin D. Westbrook

Final Report

In most enterprises, sex-role stereotyping and sex bias are problems for both men and women. A person's ethnicity does not appear to affect that assumption. In our culture, men are generally thought of as leaders and women as supporters of the men's occupational pursuits. For example, corporation presidents are most often men and secretaries are most often women; school principals are most often men and teachers are most often women. The sex relatedness of occupations and occupational roles has been established by history and educational and counseling materials have tended to reflect this historical relationship between the worker's gender and the occupation.

Occupational choice inventories are commonly used to help persons identify their interests which are similar to groups of workers. Because occupational choice inventories are developed from an assessment of characteristics of active workers, they tend to inadvertently reflect the gender-relatedness of occupations. However, a notable exception to this generalization is Holland's occupational choice theory.

Holland proposed that all occupational orientations and environments can be described by some combination of six types: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C). Since persons typically have a combination of these orientations toward work, Holland has assigned persons and their preferred occupational environments a three-letter code (e.g., RIA) that is, the initials of three of the types. A description of the types which determine the codes is as follows:

Realistic persons are oriented to the present, have more mathematical than verbal skills, prefer manipulation of things, tools, and machines, and prefer concrete to abstract tasks.

Investigative persons are analytical, abstract, cognitive, curious, and perceptive.

Artistic persons use feelings, emotions, intuition, and imagination.

Social persons use their skills with an interest in other persons in order to train or change their behavior. They rely on emotions and feelings rather than intellectual resources.

Enterprising persons are adventurous, dominant, enthusiastic, impulsive, persuasive, verbal, extroverted, self-confident, oral, and aggressive.

Conventional persons are well-controlled, neat, sociable, create a good impression and are practical and persevering.

Occupational environments which are congruent with individuals' personal orientations provide them maximum opportunities to implement their personal orientations.

While Holland makes no theoretical reference to a gender relationship between the types and persons, in practice, men more often than women show a primary code of "R" and women more often than men show a primary code of "S." Several researchers have studied the hypothesis that the wording of the items in his interest inventories causes these unbalanced patterns of codes, but their hypotheses have been disproven. Although nothing significant has been found regarding the marking of the inventory items, questions remain about the items themselves.

One question has to do with the occupations which the testee must endorse in order to be identified as having a Realistic orientation. On one of his

interest inventories, the Self Directed Search (SDS), Holland instructs the testee to answer "yes" to "occupations that interest or appeal to you..." The occupations available for endorsement do not give women many opportunities to express their Realistic preferences. Some examples are: Construction inspector, electrician, master plumber, power shovel operator, and tool designer. On the other hand, there are many realistic tasks that women regularly perform. Some examples are driving an automobile, typewriting, and operating keypunch machines and household equipment.

It can be assumed that the occupations used to identify the Realistic orientation were selected because they fit a conception of the Realistic type and incidently, they are jobs that men most often do. However, it may be that the definition of Realistic is too restricted and that an atypical definition will enable men and women to endorse it relatively equally.

A similar kind of problem exists regarding the Social type. Roughly 60% of the women who complete the SDS show a primary code of "S;" but it appears that a more severe imbalance problem exists with the "S" type. In his Occupations Finder (Holland, 1974) where he provided three-letter occupational codes for the 456 most common occupations in the United States, Holland used only 60 percent of the possible three-letter permutations of the six types. Of the 456 coded occupations 86 have S as the primary type and 313 have an S somewhere in their codes. This suggests that an important orientation of 69 percent of the most common occupations is Social. However, an alternate suggestion is that the items which define the Social orientation on the SDS do not allow testees to discriminate between relevant social orientation and a variety of less important Social interests.

Sets of descriptors for the types, which appeared in an early Holland study, were administered by Westbrook and a colleague to male and female

college students in a rank order study. It was determined (1) that several of the descriptors were unique for individual types and (2) that males and females ranked them essentially the same. The present study was supported by the U.S. Office of Education to determine whether the new descriptions for the types would be endorsed more similarly by males and females than are Holland's current items. The new descriptors of the types have been incorporated in the Dominant Characteristics Inventory (DCI).

The Dominant Characteristics Inventory (DCI)

The DCI is composed of three adjective descriptors for each of Holland's six types; Highly Trained, Skilled, and Mechanically Inclined for Realistic; Scientific, Intelligent, and Studious for Investigative; Creative, Imaginative, and Talented for Artistic; Important, Influential, and Helpful for Social; Ambitious, Aggressive, and A Leader for Enterprising; and Precise, Mathematical, and Methodical for Conventional. The triads come from long lists of descriptors which Holland's research has shown to be descriptive of workers who are representatives of the types. In a study which was designed to cause the most prominent descriptors to emerge, Westbrook and Molla (1976) found the adjective descriptors (or traits) used in the DCI to be most prominent. They were, hence, accepted as expanded definitions of the types. For example, "Highly Trained" is a partial indicator of Realistic attributes, and it can be endorsed independent of "Skilled" or "Mechanically Inclined," which may be disowned as personal descriptors.

The design of the DCI is patterned after the Minnesota Importance Questionnare (Gay, Weiss, Hendel, Dawis, & Lofquist, 1971). It is a pair-comparison instrument (180 items) which compares each trait to each other once in the format of (a) "I am more Helpful than I am Talented" or (b) "I am more Talented than I am Helpful." (Nine of the 180 items, which include each of the

18 traits, are repeated for statistical purposes and are not used in a normal analysis.) The items are arranged such that a testee can select on a machine scoreable answer sheet either "helpful" or "talented" and have a "one" recorded for the trait selected and a "zero" for the one not selected. This procedure produces for the testee a score of from zero to 17 for the 18 traits.

The pair-comparison format of the DCI produces unadjusted scores which are ipsative and therefore are interpretable only on an intraperson basis. The scores may, however, be adjusted via zero-point scaling such that it becomes possible to treat then as distances form a well defined point on a normalized scale, i.e., the scale scores acquire interval scale properties (Gilliken & Tucker, 1964).

Zero-point scaling is accomplished by adding the second part of the DCI as an absolute judgment section. The testees are asked to state in a "yes" or "no" format whether the traits are important to them. Yes is scored 1 and no is scored 0. The 1's are added to their respective raw score values, which increases the range 0-17 to 0-18. The frequency of zeros is summed and becomes the 19th raw score. As a next step, .50 is added to the 18 raw trait scores to include the expected number of times the statements would be chosen over themselves had such comparisons been made (Guilford, 1954). Z scores are then computed for the 19 raw scores and the value of the 19th z score is subtracted from each of the other scores and itself, leaving 18 z scores which have been adjusted to the individual's psychological zero point under the standard normal curve.

The Study Samples

The DCI was administered to a national sample of college professors from six teaching areas (chemistry, English, history, mathematics, modern foreign languages--French, German and Spanish--and physical education. Also surveyed

were high school teachers of the same subjects from several cities in the eastern, central, southern, and western regions of the United States. The inventory was also administered to three university classes of undergraduate students and a group of high school students.

A second inventory, the Dominant Characteristics Inventory--Secondary Level was administered to a group of high school students; and a third inventory, the Preferred Activities Inventory, was administered to students in junior high school and elementary school, and a Montessori school.

Results

Validity

The DCI was assessed for concurrent validity by administering it along with the SDS to 108 undergraduate university students. Upon completing the SDS, the testee derived a three-letter occupational code. Upon completing the DCI the testee accomplished a rank order of the 18 DCI traits. The criterion for validity of the DCI was that a statistically significant percentage of first-ranked DCI traits match the primary type (first ranked) of the SDS, three-letter code. For example, in order for a match to occur, a testee whose primary SDS code was Realistic must show a first-ranked DCI trait of either Highly Trained, Skilled, or Mechanically Inclined.

Approximately 17 (16.6%) matches were expected by change. Approximately 40% (N=43=39.96%) of the testees' highest ranked DCI traits matched the first letter of their SDS codes. This result was significant beyond the .05 level (X^2=35.27). Thus, the Chi-square analysis showed that the DCI is a statistically valid instrument. Since there is a clear, non-chance relationship between the DCI traits and SDS types, it may be assumed that the instances in which the DCI traits missed the SDS types (60% of the cases) represent valid, alternative information about the testees.

The DCI was also assessed for profile validity. All testees who complete the Inventory produce a complete profile which may be valid or, for several reasons, invalid for interpretation. Some of the reasons for producing an invalid profile are (1) testee ignorance of personal attributes or of the meaning of the traits, (2) unconcern with completing the inventory, or (3) lack of clarity of the inventory, each of which would cause testees to respond illogically to the items.

An example of a logical response to an inventory of this type is as follows: If a person said he likes apples better than he likes oranges, and he likes oranges better than he likes bananas, in order to be logical, he must say he likes apples better than he likes bananas. Saying that he likes bananas better than he likes apples would be an illogical response. (Substitute any three of the traits for apples, oranges, and bananas for a clear example of how logical and illogical responses can occur on the DCI.) Illogical responses are called circular triads, and the total number of circular triads (TCT) in each inventory determines whether it is interpretable.

It was determined in a separate study that a DCI profile can be interpreted if it has 144 or fewer TCT's. It was then administered to 836 college students, 91% of whom produced 144 or fewer TCT's. These results suggest that the DCI items are not inhibitors to valid profiles when testees are intelligent and motivated to complete it.

Reliability

The stability of the DCI traits was assessed by administering the DCI to 108 randomly selected college students twice at a ten week interval. Pearson correlation coefficients computed for each of the 18 traits ranged from .57 to .81 with a median of .67. These results indicate that the DCI is sufficiently reliable to obtain interpretable research data over a relatively long period of time.

Research Questions and Conclusions

1. Do the DCI trait responses distribute similarly by sex?

2. Do women and men who do the same jobs complete the DCI in a similar fashion?

3. Do high school teachers of a specific subject produce a profile that is similar to college professors of the same subject?

4. Does the DCI differentiate among workers in different jobs?

5. What is the smallest number of cases that would generally be required to establish a reliable group code?

6. What do the differences between males and females on DCI traits mean?

7. How early are DCI traits recognizable as personal descriptors?

Do the DCI trait responses distribute similarly by sex?

The DCI was assessed to determine the extent to which its traits are represented in a random sample of 50 males and 50 females drawn from the 836 college students in the study. Their academic majors classified by Holland types placed them as follows:

	Realistic	Investigative	Artistic	Social	Enterprising	Conventional	Undecided
	%	%	%	%	%	%	%
M	12	28	14	12	22	4	8
F	4	10	16	36	10	2	22

A one-way analysis of variance with the Bartlett-Box test for homogeneity of variance was computed by sex. Significant Fs were found for Mechanically Inclined ($p < .01$) and Mathematical ($p < .05$), and the variance was found to be heterogeneous for Mechanically Inclined ($p < .001$), Scientific ($p < .05$), Talented ($p < .05$), and Mathematical ($p < .05$). The frequencies of individual z-scores were tabulated in ten groups (See the legend of Table 1) and the mean, median, standard deviation, and range were computed for each trait (See Table 1).

Enter Table 1 About Here

Since inspection of the means and medians within the groups by sex showed remarkable similarity, a Chi square was computed on the z-score means to ascertain the similarity of the trait score distributions by sex. No significant difference was found for either group (male, X^2=4.93, df=17; female, X^2=9.24, df=17). A Spearman rho correlation computed between the ranked means by sex showed a coefficient of rho=.92. On the other hand, Table 1 shows some marked discrepancies between the range of grouped scores for males and females. The validity of the grouping procedure was checked by computing a Spearman rho between the ranks of the grouped z-score means by sex (rho=.97). A t test was then computed between male and female range scores; and the female range was found to be significantly smaller than that of males (t=13.42, $p < .001$).

Conclusion: While the range of self rating on DCI traits is significantly more restricted for females than males, the mean and median ratings are very similar. This suggests that no trait in the array is considered by females to be undescriptive of themselves. It further suggests that males and females are about equally likely to select any of the traits as being primarily descriptive of themselves.

Do women and men who do the same jobs complete the DCI in a similar fashion?

A one-way analysis of variance was computed for each of the 18 traits between the total sample of male (N=339) and female (N=264) college professors who reported satisfaction with their jobs (Total N=627, Total Satisfied=603). Males were found to have significantly higher means than women on Scientific and Mathematical; and females had significantly higher means than males on

Ambitious and A Leader. Although four significant differences out of 18 analyses is a number greater than chance, unequal sample sizes within the academic area groups could contribute to the differences. Additionally, the large sample size would tend to show significant differences even though the differences may have been very small. Consequently, one-way analyses of variance were computed between the sexes within the academic areas. Within these analyses, male and female college professors differed significantly on a maximum of two of the traits, one group differed on none, and no pattern of differences emerged (See Table 2).

However, the differences between male and female physical education (PE) and foreign language (FL) high school teachers were markedly different in number. One possible explanation for this is that they do not form homogeneous groups.

Physical education majors can have a variety of primary orientations which range from dance to competitive athletic. High school PE teachers are also often college athletes who minored in PE and majored in something else. They may have taken a PE position because it was available, or they may teach in more than one capacity. Male PE teachers had higher means than females on six of the DCI traits (see Table 2).

Enter Table 2 About Here

The FL teachers are clearly different in that they come from French, Spanish and German majors. Whether this should cause them to respond differently to the traits is not clear. They differ on seven of the traits with male means being higher on two and female means being higher on five. As can be observed from Table 2, there is no clear pattern either within or across groups and levels of teaching.

Because of the similarities between college professor and high school teacher profiles, the academic area groups were integrated and their trait scores were summarized into ten groups (see Tables 3 through 8). Tables 5 and 7 show the results of the FL and PL groups. When the standard deviations and ranges are visually compared to those of other groups, they look unspectacular. Hence, it appears that the observed differences may have little effect on the rank ordering of the traits. In any event, the differences appear to be academic area rather than gender linked.

Enter Tables 3 - 8 About Here

Conclusion: While there may be sex differences in responses to the DCI items across a large and varied population of male and female workers, the responses of satisfied male and female workers within an occupational group are relatively similar.

Do high school teachers of a specific subject produce a profile that is similar to that of college professors of the same subject?

In order to compare high school teacher and college professor responses on the DCI, a group profile of college professor responses for each academic area was computed and each individual teacher's profile[1] was compared to his/her respective group profile. When high school teacher profiles were compared to their respective groups, the percentages of similar profiles ranged from 55% to 69% with a median of 64%[2].

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[1] The profile analysis procedure was a routine one which was taken from measurement literature. It amounts to summing the squared differences between the scale scores of two profiles. An empirically established maximum acceptable size for this difference value was computed.

[2] Although the numbers of blacks were small and variable within the academic areas (though relatively comparable across the total sample to their percentage across the national population -- 11%) the range (40% to 71% with a median of 60%) was similar to the total group. The numbers of Asian Americans, Hispanics, and Native Americans were too small for meaningful computation, but, in general, they did not differ from the total group.

Additionally, a two-way analysis of variance was computed between 50 males and 50 females who were randomly selected from the combined samples of college professors and high school teachers of English. The effort here was to determine whether sex and level of education affected the rank order of the traits. There was a significant difference ($p < .05$) between males and females on Mechanically Inclined which did not affect its ranked position. The male mean was -.40 and the female mean was -.88, which are consistent with those in Table 6. Table 9, columns 1 and 2, shows all of the means which may be compared with Table 6.

Enter Table 9 About Here

Significant differences were also observed for the main effects and years of education on Important and Influential ($p < .01$). The size of the means suggested that the differences were between high school teachers who had an educational level between 16 and 18 years (BA to MA degrees) and men and women who had a doctorate degree or one year less (19-20 years of education). In both instances the means were in the low average range and would have had little to no effect on the ranked position.

Conclusion: High school teachers of a subject produce a profile similar to that of college professors who teach their subject.

Does the DCI differentiate among workers in different jobs?

In order to answer this question, the mean scores for college professors of each academic area were compared by way of the one-way analysis of variance. The Newman-Keuls procedure was used to determine which means were significantly different, thereby establishing clusters of similar means. The clusters indicate a similarity of importance of a trait for the academic areas represented in a given cluster (See Table 10).

Enter Table 10 About Here

Conclusion: The DCI traits do differentiate among worker groups.

What is the smallest number of cases that would generally be required to establish a reliable group code?

In order to determine the smallest number of cases that would be required to establish a reliable code for a group, successive samples of 50, 40, 30, and 20 profiles were randomly drawn, with replacement, from the total samples of male and female college professors and high school teachers of English. Table 9 shows the means by sex for the different samples and an asterisk when the two-way analysis of variance (sex by level of education) showed differences between the means.

Determining the rank order of the first five traits and the average of the means by sex shows that the order of similarity of successively drawn samples to the total sample (Table 6) is 50, 30, 40, and 20. The first five traits for the total sample is Intelligent, Helpful, Talented, Highly Trained, and Studious. Imaginative and Skilled are ranked fifth and sixth, respectively, for the sample of 40, which means the seven of the traits in the successive samples must be included in order to account for the first five places.

Conclusion: While samples smaller than 50 profiles on a satisfied worker group appear similar to a sample of 50 or larger, it does not appear that they should be relied upon for establishing a code for the group. However, similarities between the sexes suggest that males and females, in any proportion, that equal 50 or more profiles can produce a reliable code for a group.

What do the differences between males and females on DCI traits mean?

The traits of the successively drawn random samples of male and female college professors and high school teachers of English were subjected to [illegible] two analyses of variance (sex by years of education) to attempt to provide some information about differences between male and female means in the total sample (Table 6), none of which was significant. The means that will be discussed, however, were shown to be significantly different in the successively drawn random samples.

In the various samples, males with education above the master's degree rated themselves more Mechanically Inclined than women. Subjects, primarily females, who had more than a B.A. but less than an M.A. rated themselves more Important. Subjects, primarily females, with an M.A. or less, with the overwhelming weight going to subjects with a B.A. but less than an M.A., rated themselves more Influential.

Subjects, primarily males, who had education beyond the M.A. rated themselves more Highly Trained. Subjects, primarily females, who had more than a B.A. but less than an M.A. and more than an M.A. but less than a doctorate degree rated themselves more Intelligent than others. Subjects, primarily females, who had more than a B.A. but less than an M.A. and more than an M.A. but less than a Ph.D. rated themselves more Studious than others. Subjects, primarily females, who had less than a M.A. rated themselves more Aggressive than others. And subjects, primarily females, who either had an M.A. or some work beyond the B.A. rated themselves more A Leader than others.

Females who have begun graduate school but have attained less than a Ph.D. rated themselves more Ambitious than males, and males with an M.A. plus but less than a Ph.D. rated themselves more Skilled than females.

Conclusion: While there appear to be basically inconsequential differences between males and females on DCI traits, those that exist bear some relationship to predictions by Holland theory, i.e., males show some tendencies toward rating themselves higher than females on Realistic traits and females rate themselves similarly in relation to males on Social traits. But these data suggest that the differences are not as disproportionate as they have been thought to be, and some differences are in the reverse of predictions. These data show females rating themselves higher than males on some Investigative and Enterprising traits.

The analyses in Table 9, i.e., level of education, lead to the conclusion that there are no inherent differences between male and female ratings of DCI traits. Observed differences appear traceable to situational, social desirability, or psychological variables.

Codes for Academic Areas in the Sample

Since the DCI traits are attributes of persons' personality and occupational orientations which have been described by Holland (1973), it appears appropriate to relate DCI occupational codes to Holland codes. Figure 1 shows this relationship, which is described under Triad Means, page 20. However, the limiting of DCI codes to this form would obscure the personal information that is otherwise available.

Because DCI traits are expansions of the meaning of the Holland types which they describe, and because they have been incorporated into the DCI in the rank order of their importance, for the time being, they may be labelled for the trait which they describe.

Enter Table 11 About Here

Table 11 lists trait labels, the DCI traits, and their meanings. The trait meanings may be compared to Holland type meanings on page 2. Codes for the teaching groups in this study are listed below so that they may be compared to Holland codes.

Teaching Area	Holland Code	DCI Code
Mathematics	IRA	$C_2I_2S_3C_1$
Chemistry	IAR	$I_1I_2S_3A_3$
Foreign Languages	AIS	$I_2A_2S_3A_1$
English	ASE	$I_2S_3A_3R_1$
Physical Education	SRE	$S_3E_3R_2I_2$
History	SEI	$I_2S_3I_3A_2$

How early are DCI traits recognizable as personal descriptors?

In order to determine how early DCI traits become recognizable as descriptors of individuals, the DCI-Secondary Level (DCI-SL) and the Preferred Activities Inventory (PAI) were developed and administered to appropriate samples.

The DCI-SL

The DCI-SL is the DCI abbreviated by excluding the first trait[3] for each trait triad. Its traits are Skilled and Mechanically Inclined for Realistic, Intelligent and Studious for Investigative, Imaginative and Talented for Artistic, Influential and Helpful for Social, Aggressive and A Leader for Enterprising, and Mathematical and Methodical for Conventional. It was administered to 549 seventh through 10th graders after determining that an instrume[illegible]ith 30 or fewer TCT would be interpretable.

[3] The TCT score mean for 11th and 12th graders on the DCI was significantly higher than for other groups. It was also suspected that the highest ranked traits for the Holland types -- Highly Trained, Scientific, Creative, Important, Ambitious, and Precise -- may be developmentally above most adolescents.

Of the 549 subjects, 286 or 52 percent produced interpretable profiles. Males (N=132) and females (N=155) were compared on the 12 traits and were found to differ significantly on skilled, Mechanically Inclined, Aggressive, and A Leader. Females had the higher mean on A Leader only.

The PAI

The PAI is a further abbreviated version of the DCI for children. It is organized in the same pair-comparison format with the lowest ranked DCI trait for each Holland type written as an activity statement as follows:

Realistic - Mechanically Inclined
I like to make or repair things with my hands.

Investigative - Studious
I like to collect information from reading books or from observing how things happen.

Artistic - Talented
I like to do things for people's enjoyment (for example, draw, dance, sing, speak, or play a musical instrument.

Social - Helpful
I like to do things with people to make their lives better.

Enterprising - A Leader
I like to do things that make lots of people want to be around me.

Conventional - Methodical
I like to do things that require me to be careful and patient.

The PAI was administered to 379 children between 2½ and 14½ years old after determining that an instrument was interpretable if it had four or fewer TCTs. Of the 379 children who completed the instrument, 355 or 94% produced four or fewer TCTs.

In order to determine the validity of the children's responses, 127 of them were administered the PAI at school and it was sent home to be completed by their mothers. In printed instructions the mothers were asked to complete the PAI, independent of the child, as she thought the child would complete it. Table 12 shows the results of the one-way analysis of variance results by grade levels.

Mothers' responses differed significantly from the children's on R_3, S_3, and C_3 for kindergarteners. For all other groups, they differed on only one activity, which was either S_3 or C_3. Mothers predicted for male and female children exactly the same (i.e., they missed an S_3 and C_3).

In separate analyses by sex with all grades combined , the children showed significant differences between R_3 (male mean higher) and A_3 (female mean higher).

Conclusion: The results of the DCI-SL and the PAI show that DCI traits are recognizable, in direct or translated form, as personal descriptors very early in the individual's life.

The fact that mothers can predict with such a high degree of success how their children respond on the PAI appears of singular importance. It appears a short step between observing consistent preferences for activities in 2½ year old children and understanding how they got implanted, how they get maintained, and how they change.

Although the sample is not sufficiently large to suggest where it begins, by 8th grade stereotyping has begun. Boys' preferences have become robust and girls' have become dainty. The process continues and becomes more pronounced during adolescence. Fortunately, in terms of DCI traits, the trend reverses during young adulthood and satisfied males and females on jobs look very similar.

The workers in this study are professionals which equates with a high level of education. Those in the same jobs learned to describe themselves similarly through their capabilities for self observation. Early sex neutral education will probably achieve similar results significantly earlier.

Interpreting the Computerized Results

Figure 1 is a reduced copy of DCI computerized results. Each testee who completes the DCI receives an individualized printout. The following discussion applies to DCI printouts in general.

Enter Figure 1 About Here

Validity Score

On the printout, the first significant entry is the validity score. If the Total Circular Triads are fewer than 145, the profile is interpretable. This is an interpretable profile because the Validity Score is 10.

DCI Scales and Adjusted Scale Values

The DCI Scales are the traits that were endorsed on the Inventory. The scores to the right of the Scales -- Adjusted Scale Values -- are z scores which represent the actual rank order of the traits for this respondent. The largest z score (1 78) is for Precise which indicates that the respondent chose it most often as an important personal descriptor when it was paired with other traits.

On the graph to the right of the Adjusted Scale Values, you will note an X on line with the dots which indicate approximately +1.78. If the respondent had been perfectly logical in her responses (as would have been indicated by zero (0) Total Circular Triads) the z score would have been +1.65 as is plotted with a Y on line with the dots indicating +1.65 on the graph.

If the respondent's Adjusted Scale Value had been +1.65, instead of an X or Y, a plus sign (+) would have been substituted on the point marked by the Y. You will note that the respondent was perfectly logical in responding to Talented (-.66), Important (-1.59) and Ambitious (.66). The negative sign of the z score for Talented and Important indicates that the traits were relatively unimportant for this respondent. When these traits were paired with others, they were generally not chosen as personal descriptors.

Triad Means

To the left of the DCI Scales, dotted brackets separate the scales into triads. Highly Trained (Hig), Skilled (Ski), and Mechanically Inclined (Mec) constitute the triad which describes attributes of the Holland type, Realistic (R). The mean (average) of the Adjusted Scale Values of Hig, Ski, and Mec constitutes the Triad Mean. This respondent's Triad Mean for R equals -.41. The other triad scores are derived in the same manner.

Highest Traits

Below the Triad Means is the label Highest Traits. Four trait names, which agree with the Adjusted Scale Values' rank order, are listed across the sheet. These labels (Precise, Helpful, Mathematical, and Methodical) are placed in this manner for the readers convenience. They can be scanned more easily than the numeric Adjusted Scale Values.

Best Matched Occupational Groups with Analysis Summary

The academic areas (occupations) named below this label indicate, in rank order, the ones to which this respondent's profile was most similar. The respondent is a female, high school, mathematics teacher. Of the six groups normed in this study, her profile is shown to be similar to the college (sum of squared differences between profiles) for chemistry is next in similarity, it is sufficiently large (SSD=21.50 or more) to be judged dissimilar.

General Analysis

This respondent looks like a person who prefers a work environment which requires structure, orderliness, and precision (Precise, Mathematical, and Methodical); she prefers to interact with this environment in a systematic manner (Scientific); and she likes to be of assistance to persons who are interested in mastering her preferred environment (Helpful).

Summing Up

The findings of this research project suggest that the DCI traits are recognizable as personal descriptors, that women and men in general and women and men in occupational groups respond to them similarly, and that a relatively small mixed- or single-sex group can establish a reliable occupational code. They show further that the traits are recognizable by adolescents and children and that mothers recognize them in their children as young as 2½ years old. Since the observed differences between children and adolescents on Realistic traits diminish in adult and worker groups who have learned the skill of self observation, it may be inferred that personal orientations toward work are learned. Consequently, it appears that sex neutral vocational education would go far toward eliminating sex role stereotyping in occupational selection.

The DCI gives a heretofore unavailable method of assessing personal traits which when possessed suggest potential for satisfying occupational selection; it offers an alternative to interest assessment which focuses on endorsement of occupations and occupational situations; it offers the potential for developing a more precise knowledge of occupational similarities than is currently available; and because of its special attributes, it can be normed on all major occupational groups and made available for users in three to five year cycles.

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Table 1

Grouped DCI Z-Scores of a Random Sample Male and Female College Students

	Male (N=50)				Female (N=50)			
Trait	Mean	Median	S.D.	Range	Mean	Median	S.D.	Range
Highly Trained	4.96	4.87	1.18	6	4.92	4.83	.94	4
Skilled	5.98	6.08	1.19	6	5.74	5.82	.99	5
Mechanically Inclined	5.56	5.36	1.63	8	4.94	4.82	.94	3
Scientific	5.58	5.27	1.40	6	5.10	4.96	1.04	4
Intelligent	6.64	6.71	1.91	7	6.50	6.56	1.04	4
Studious	5.94	5.88	1.15	6	5.90	6.07	1.31	5
Creative	6.14	6.17	1.26	5	6.08	6.24	1.28	7
Imaginative	6.36	6.50	1.08	5	6.14	6.24	1.01	6
Talented	6.14	6.55	1.40	6	5.96	5.97	1.05	5
Important	6.08	6.19	1.48	8	5.94	5.96	1.42	5
Influential	6.02	6.06	1.44	8	5.90	5.93	1.20	5
Helpful	6.60	6.72	1.26	7	6.64	6.72	1.02	4
Ambitious	6.50	6.60	1.23	7	6.66	6.83	1.02	5
Aggressive	5.78	5.79	1.31	6	5.80	5.64	1.11	5
A Leader	5.76	6.00	1.49	7	5.82	5.86	1.30	5
Precise	5.94	5.93	1.18	6	5.88	5.75	1.02	4
Mathematical	5.60	5.42	1.52	7	5.14	5.12	1.11	5
Methodical	5.72	5.78	.99	5	5.50	5.36	1.06	5

Z-Score Groups:

1 = Lo	-	-4.00	6 = .01	-	1.00
2 = -3.99	-	-3.00	7 = 1.01	-	2.00
3 = -2.99	-	-2.00	8 = 2.01	-	3.00
4 = -1.99	-	-1.00	9 = 3.01	-	4.00
5 = - .99	-	0	10 = 4.01	-	Highest

Table 2

Table of Significant Differences Between Male and Female College Professors and High School Teachers Within Academic Areas from the One-Way Analysis of Variance

	Academic Area											
	AA1		AA2		AA3		AA4		AA5		AA6	
	M	F	M	F	M	F	M	F	M	F	M	F
NCP=	53	27	67	7	48	50	44	47	77	111	50	22
NHST=	39	49	32	21	58	71	23	65	55	56	42	33
Trait												
Highly Trained												
Skilled					C	H						
Mechanically Inclined	H		C		H				H			
Scientific												
Intelligent										C		
Studious		H				H						
Creative												
Imaginative									H			
Talented												
Important												
Influential									H			
Helpful	C										C	
Ambitious						H						C
Aggressive						H			H			
A Leader						C			H			
Precise						H						
Mathematical					H				C			
Methodical									H			

C = College Professor with Higher Mean by Sex

H = High School Teacher with Higher Mean by Sex

AA = Academic Area

AA1 = Mathematics

AA2 = Chemistry

AA3 = Foreign Languages

AA4 = English

AA5 = Physical Education

AA6 = History

Table 3

Group DCI Z-Scores for Male and Female College Professors and High School Teachers of Mathematics

	Male (N=96)				Female (N=82			
Trait	Mean	Median	S.D.	Range	Mean	Median	S.D.	Range
Highly Trained	6.20	6.31	1.18	5	6.12	6.19	1.06	4
Skilled	6.12	6.13	.89	5	6.27	6.39	.93	4
Mechanically Inclined	5.46	5.33	1.28	7	5.20	5.01	1.07	4
Scientific	6.16	6.26	1.13	5	5.88	5.82	1.08	4
Intelligent	6.74	6.87	1.17	6	6.96	7.09	1.07	5
Studious	6.01	6.05	1.23	5	6.39	6.35	1.06	4
Creative	5.90	5.94	1.22	7	5.82	5.64	1.25	6
Imaginative	6.18	6.23	1.10	5	5.79	5.73	1.17	5
Talented	6.36	6.41	1.05	5	6.17	6.32	1.22	5
Important	5.24	5.10	1.04	5	5.42	5.25	1.21	6
Influential	5.52	5.42	1.00	5	5.58	5.43	1.15	5
Helpful	6.93	7.05	.99	4	6.66	6.80	1.10	5
Ambitious	5.40	5.17	1.20	5	5.57	5.50	1.21	6
Aggressive	4.95	4.82	1.23	6	5.04	4.89	1.22	6
A Leader	5.65	5.71	1.30	6	5.71	5.63	1.20	5
Precise	6.47	6.71	1.16	5	6.40	6.60	.99	4
Mathematical	6.90	6.98	1.01	5	7.11	7.16	.90	5
Methodical	6.25	6.34	1.16	6	6.26	6.31	.98	4

Z-Score Groups:

1 = Lo	-	-4.00	6 = .01	-	1.00
2 = -3.99	-	-3.00	7 = 1.01	-	2.00
3 = -2.99	-	-2.00	8 = 2.01	-	3.00
4 = -1.99	-	-1.00	9 = 3.01	-	4.00
5 = - .99	-	0	10 = 4.01	-	Highest

Table 4

Grouped DCI Z-Scores for Male and Female College Professors and high School Teachers of Chemistry

	Male (N=106)				Female (N=30)			
Trait	Mean	Median	S.D.	Range	Mean	Median	S.D.	Range
Highly Trained	6.38	6.39	1.05	4	6.43	6.50	.97	3
Skilled	6.33	6.38	.85	4	6.17	6.17	1.05	4
Mechanically Inclined	5.81	5.70	1.27	5	5.33	5.25	.99	4
Scientific	7.16	7.14	.69	3	7.17	7.19	.74	2
Intelligent	7.02	7.08	.98	5	7.30	7.41	.99	4
Studious	6.32	6.60	1.25	5	6.33	6.63	1.16	5
Creative	6.09	6.03	1.22	5	6.03	5.93	1.38	5
Imaginative	6.45	6.58	1.13	5	6.13	6.14	1.19	5
Talented	6.51	6.67	1.07	5	6.33	6.23	1.06	4
Important	5.51	5.30	1.11	5	5.20	5.17	1.00	3
Influential	5.67	5.48	.96	5	5.53	5.40	1.34	4
Helpful	6.83	6.92	.92	5	6.70	6.79	.75	3
Ambitious	5.51	5.27	1.12	5	5.37	5.28	1.10	3
Aggressive	5.23	5.08	1.04	4	5.20	5.10	.89	3
A Leader	5.74	5.72	1.04	5	5.90	5.43	1.21	4
Precise	6.38	6.44	1.12	5	6.07	6.20	1.28	5
Mathematical	6.08	6.08	1.09	5	6.43	6.50	.97	3
Methodical	6.17	6.12	1.16	6	5.87	5.88	1.07	4

Z-Score Groups:

1 = Lo	-	-4.00	6 = .01	-	1.00
2 = -3.99	-	-3.00	7 = 1.01	-	2.00
3 = -2.99	-	-2.00	8 = 2.01	-	3.00
4 = -1.99	-	-1.00	9 = 3.01	-	4.00
5 = - .99	-	0	10 = 4.01	-	Highest

Table 5

Grouped DCI Z-Scores for Male and Female College Professors and High School Teachers of Foreign Languages

	Male (N=108				Female (N=136)			
Trait	Mean	Median	S.D.	Range	Mean	Median	S.D.	Range
Highly Trained	6.17	6.25	1.13	7	6.32	6.39	1.06	7
Skilled	6.33	6.32	.88	6	6.41	6.46	.95	7
Mechanically Inclined	5.08	4.94	1.14	6	4.79	4.73	.92	5
Scientific	5.24	5.19	1.01	5	5.07	4.97	.98	5
Intelligent	7.09	7.15	.95	7	7.27	7.40	.93	6
Studious	6.22	6.43	1.16	7	6.43	6.54	1.07	7
Creative	6.68	6.82	1.07	6	6.59	6.72	1.13	6
Imaginative	6.88	6.94	.96	7	6.75	6.88	.96	5
Talented	6.66	6.84	1.03	5	6.62	6.77	1.04	6
Important	5.49	5.26	1.18	5	5.70	5.66	1.18	6
Imaginative	5.83	5.85	10.6	6	5.92	5.88	1.09	6
Helpful	6.78	6.84	.92	7	6.69	6.83	.99	6
Ambitious	5.31	5.19	1.07	5	5.82	5.73	1.14	7
Aggressive	4.98	4.94	1.07	7	5.40	5.29	1.21	7
A Leader	5.71	5.57	1.19	6	6.02	6.06	1.14	6
Precise	5.99	5.99	1.03	5	6.27	6.42	1.18	7
Mathematical	4.95	4.86	1.08	8	4.70	4.71	.79	5
Methodical	5.88	5.85	1.07	6	6.03	6.04	1.14	7

Z-Score Groups:

1 = Lo	-	-4.00	6 = .01	-	1.00
2 = -3.99	-	-3.00	7 = 1.01	-	2.00
3 = -2.99	-	-2.00	8 = 2.01	-	3.00
4 = -1.99	-	-1.00	9 = 3.01	-	4.00
5 = - .99	-	0	10 = 4.01	-	Highest

Table 6

Grouped DCI Z-Scores for Male and Female College Professors and High School Teachers of English

	Male (N=77)				Female (N=128)			
Trait	Mean	Median	S.D.	Range	Mean	Median	S.D.	Range
Highly Trained	6.52	6.70	.86	4	6.41	6.57	1.00	5
Skilled	6.40	6.42	.73	3	6.46	6.55	.96	9
Mechanically Inclined	5.01	4.86	1.06	5	4.83	4.74	1.00	6
Scientific	5.26	5.18	1.00	5	5.11	5.01	.99	6
Intelligent	6.91	6.98	.83	4	7.06	7.11	.92	6
Studious	6.43	6.62	1.02	5	6.45	6.65	1.03	7
Creative	6.23	6.42	1.11	4	6.32	6.42	1.14	7
Imaginative	6.40	6.52	.99	4	6.37	6.48	1.03	7
Talented	6.52	6.62	.84	3	6.59	6.74	1.07	6
Important	5.25	5.11	1.07	5	5.41	5.36	1.12	7
Influential	5.47	5.39	1.05	5	5.76	5.57	1.17	7
Helpful	6.58	6.68	1.00	5	6.75	6.76	.88	7
Ambitious	5.47	5.26	1.11	5	5.84	5.81	1.24	4
Aggressive	5.04	4.93	1.11	6	5.32	5.11	1.20	6
A Leader	5.51	5.31	1.18	5	5.83	5.74	1.30	8
Precise	6.26	6.30	.94	5	6.16	6.22	1.08	6
Mathematical	5.00	4.90	1.01	4	4.94	4.89	.96	7
Methodical	6.16	6.16	1.00	5	5.94	5.97	1.00	5

Z-Score Groups:

1 = Lo	-	-4.00	6 = .01	-	1.00
2 = -3.99	-	-3.00	7 = 1.01	-	2.00
3 = -2.99	-	-2.00	8 = 2.01	-	3.00
4 = -1.99	-	-1.00	9 = 3.01	-	4.00
5 = - .99	-	0	10 = 4.01	-	Highest

Table 7

Grouped DCI Z-Scores for Male and Female College Professors and High School Teachers of Physical Education

	Males (N=140)				Females (N=175)			
Trait	Mean	Median	S.D.	Range	Mean	Median	S.D.	Range
Highly Trained	6.32	6.38	1.12	6	6.20	6.29	1.11	6
Skilled	6.52	6.61	.95	7	6.65	6.73	.97	7
Mechanically Inclined	5.54	5.41	1.24	7	5.63	5.58	1.27	8
Scientific	5.65	5.40	1.30	7	5.42	5.30	1.15	7
Intelligent	6.38	6.45	1.20	7	6.57	6.65	1.19	6
Studious	5.76	5.69	1.26	7	5.87	5.82	1.18	6
Creative	6.02	6.05	1.14	6	5.99	6.08	1.31	7
Imaginative	6.27	6.26	.97	5	6.13	6.18	1.17	6
Talented	6.34	6.48	1.08	6	6.35	6.40	1.15	8
Important	5.70	5.73	1.16	6	5.69	5.64	1.22	7
Influential	6.29	6.47	1.30	7	5.99	6.01	1.29	6
Helpful	7.11	7.20	1.00	7	7.09	7.13	.92	6
Ambitious	6.11	6.12	1.28	8	6.02	5.97	1.34	6
Aggressive	6.07	6.21	1.28	7	5.48	5.43	1.20	6
A Leader	6.95	7.14	1.18	6	6.60	6.80	1.33	7
Precise	6.26	6.24	1.35	8	6.13	6.24	1.13	8
Mathematical	5.14	4.99	1.18	7	5.21	5.11	1.06	5
Methodical	6.02	5.99	1.09	6	6.07	6.07	1.05	7

Z-Score Groups:

1 = Lo	-	-4.00	6 = .01	-	1.00
2 = -3.99	-	-3.00	7 = 1.01	-	2.00
3 = -2.99	-	-2.00	8 = 2.01	-	3.00
4 = -1.99	-	-1.00	9 = 3.01	-	4.00
5 = - .99	-	0	10 = 4.01	-	Highest

Table 8

Grouped DCI Z-Scores for Male and Female College Professors and High School Teachers of History

	Male (N=100)				Females (N=61)			
Trait	Mean	Median	S.D.	Range	Mean	Median	S.D.	Range
Highly Trained	6.31	6.35	1.05	5	6.25	6.36	.99	6
Skilled	6.25	6.28	.90	4	6.16	6.20	.99	6
Mechanically Inclined	5.07	4.90	1.21	7	4.72	4.75	.95	6
Scientific	5.22	5.10	.96	5	4.93	4.94	.91	5
Intelligent	6.87	6.94	.90	5	7.02	7.12	1.02	6
Studious	6.45	6.55	1.06	5	6.44	6.60	1.06	5
Creative	6.08	6.22	1.12	5	6.21	6.59	1.25	5
Imaginative	6.44	6.59	1.13	5	6.34	6.62	1.18	6
Talented	6.37	6.55	1.06	6	6.38	6.63	1.10	5
Important	5.70	5.50	1.18	4	5.59	5.48	1.20	6
Influential	6.02	6.17	1.15	4	5.85	5.89	1.14	5
Helpful	6.73	6.85	.98	5	6.51	6.72	.89	4
Ambitious	5.49	5.28	1.09	5	5.80	5.73	1.24	6
Aggressive	5.19	5.02	1.11	5	5.33	5.24	1.06	6
A Leader	5.85	5.93	1.22	6	5.87	5.89	1.19	6
Precise	5.97	5.98	1.17	5	5.82	5.97	1.23	6
Mathematical	4.68	4.67	.83	5	4.57	4.56	.88	5
Methodical	6.01	6.01	1.06	4	5.64	5.58	1.03	6

Z-Score Groups:

1 = Lo	-	-4.00	6 = .01	-	1.00
2 = -3.99	-	-3.00	7 = 1.01	-	2.00
3 = -2.99	-	-2.00	8 = 2.01	-	3.00
4 = -1.99	-	-1.00	9 = 3.01	-	4.00
5 = - .99	-	0	10 = 4.01	-	Highest

Table 9

DCI Trait Means of Different Sample Sizes Drawn Successfully and Randomly from the Total Sample of College Professors and High School Teachers of English

	Means							
	M	F	M	F	M	F	M	F
Trait	N=50	N=50	N=40	N=40	N=30	N=30	N=20	N=20
Highly Trained	1.07	.81	1.08*	.67	1.08	1.10	1.20*	.80
Skilled	.95	.87	1.05	.86	1.01	1.11	97*	.65
Mechanically Inclined	- .40	- .88	- .46	- .67	- .50	- .76	- .49	- .59
Scientific	- .22	- .50	- .08	- .32	- .25	- .19	- .48	- .56
Intelligent	1.44	1.54	1.43	1.70	1.46	1.50	1.60	1.58
Studious	1.04	.96	.82	1.03	1.02	1.00	1.29	1.51
Creative	.62	.80	.82	.78	.57	.48	.70	.92
Imaginative	.83	.79	1.00	.85	.70	.40	.91	.75
Talented	.97	.99	1.03	1.11	1.17	.93	1.23	.85
Important	- .27	- .11	- .13	- .01	- .13	- .07	- .22	.08
Influential	- .06	.34*	.07	.57*	- .11	- .01	.12	.20
Helpful	1.17	1.29	1.07	1.24	.91	1.15	.95	1.15
Ambitious	- .0	.31	- .01	.43	- .24	.57*	.39	.67
Aggressive	- .45	- .15	- .35	.21*	- .47	.34*	- .49	.01
A Leader	- .10	.22	.18	.72*	- .05	.05	.14	.40
Precise	.84	.56	.66	.77	.86	.82	.82	.86
Mathematical	- .44	- .64	- .34	- .36	- .50	- .52	- .83	- .45
Methodical	.68	.34	.42	.71	.57	.65	.75	.73

Table 10

Clusters of Academic Areas Arranged in Increasing Order of Group Means on DCI Traits

Trait	Clusters				
	1	2	3	4	5
Highly Trained	acdefb				
Skilled	a(f	f)dcb	e		
Mechanically Inclined	fcda	eb			
Scientific	cdf	e	a	b	
Intelligent	e	afdcb			
Studious	e	a(dcf	dcf)b		
Creative	aefdb	c			
Imaginative	ae(fd	fdb	b)c		
Talented	ae(fbd	fbd)c			
Important	adfceb				
Influential	ad(fcb	fcb)e			
Helpful	fa(dc	dcb	b)e		
Ambitious	acfdb	e			
Aggressive	a(fdc	fdc)b	e		
A Leader	adfcb	e			
Precise	cfedab				
Mathematical	f(c	c)d	e	b	a
Methodical	cfadeb				

a = Mathematics
b = Chemistry
c = Foreign Languages
d = English
e = Physical Education
f = History

( ) Academic Areas that appeared in two clusters

Table 11

DCI Trait Labels, the Traits and Their Meanings

Label	Trait and Meaning
R_1	HIGHLY TRAINED persons perceive themselves as being prepared, qualified, or instructed to a favorable or high degree to perform specific tasks.
R_2	SKILLED persons perceive themselves as having a high level of ability which was gained by experience or training.
R_3	MECHANICALLY INCLINED persons perceive themselves as having theoretical or practical knowledge of the design, construction, operation, or care of either or both simple or complex machinery.
I_1	SCIENTIFIC persons perceive themselves as using the systematic and exact principles and/or methods in order to solve problems.
I_2	INTELLIGENT persons perceive themselves as showing or having much knowledge, awareness, understanding, and critical ability and a quickness for learning.
I_3	STUDIOUS persons perceive themselves as being thoughtful, zealous, deliberate, and as giving careful attention to task completion.
A_1	CREATIVE persons perceive themselves as having the capacity to use experience to cause things to come into existence through their productive or inventive abilities.
A_2	IMAGINATIVE persons perceive themselves as being capable of producing mental images of new and useful objects or ideas or of producing new uses for and variations on old objects or ideas.
A_3	TALENTED persons perceive themselves as having native ability for a specific pursuit which can be cultivated or improved through practice.
S_1	IMPORTANT persons perceive themselves as having the capabilities for becoming powerful and authoritative and for occupying a high position.
S_2	INFLUENTIAL persons perceive themselves as having capabilities for gaining favors for themselves or others by controlling the behavior of others.
S_3	HELPFUL persons perceive themselves as aiding, assisting, or making it easier for other persons to accomplish goals, grow, or change.
E_1	AMBITIOUS persons perceive themselves as being eagerly desirous of obtaining success, power, superiority, or distinction and puts forth effort toward these ends.
E_2	AGGRESSIVE persons perceive themselves as being bold and energetic in the pursuit of their ends and in using enterprise and initiative in the pursuit of their goals.
E_3	A LEADER perceives the self as one who guides, directs, or shows the way by going before or along with followers.
C_1	PRECISE persons perceive themselves as being or needing to be absolutely correct or accurate when performing tasks.
C_2	MATHEMATICAL persons perceive themselves as being rigorously exact and orderly in following tested procedures in solving problems.
C_3	METHODICAL persons perceive themselves as being systematic, orderly, and predictable in acting, expressing themselves, or in thinking.

Table 12

Summary of Parent/Child Differences from One-Way Analysis of Preferred Activities Inventory Results

			Activity/Holland Type					
Group	Grade	N	R_3	I_3	A_3	S_3	E_3	C_3
Parent		16						
Child	Pre-School	16						
Parent		16						
Child	Kindergarten	16	*			*		*
Parent		10						
Child	1	10				*		
Parent		18						
Child	2	18				*		
Parent		16						
Child	3	16				*		
Parent		9						
Child	4	9						*
Parent		7						
Child	5	7						
Parent		15						
Child	6	15						*
Parent		10						
Child	7	10						
Parent		10						
Child	8	10						

* = Group with Higher mean

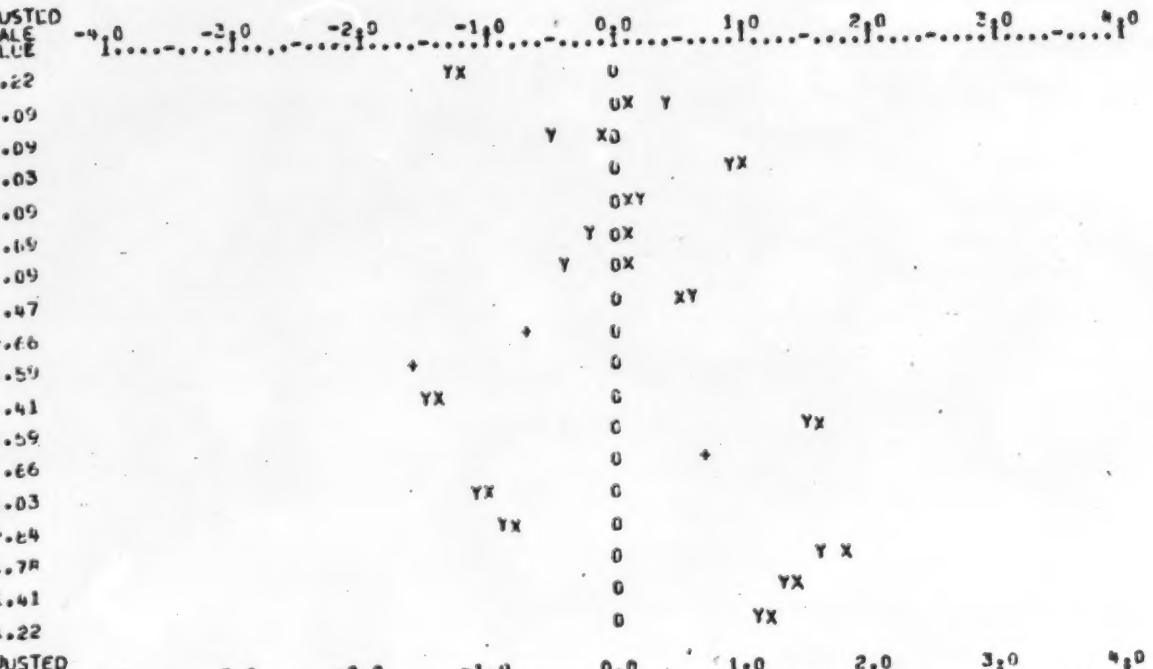
Figure 1

REPORT ON THE DOMINANT CHARACTERISTICS INVENTORY
(DCI)
1978 EDITION

DATE: 1/19/79 ID: 17935210

VALIDITY SCORE (TOTAL CIRCULAR (RIADS) = 10
INVALID RESPONSE RANGE BEGINS AT 145.
DCI IS VALID.

TRIAD MEANS		DCI SCALE	ADJUSTED SCALE VALUE
		...HIGHLY TRAINED	-1.22
R -.11	...	SKILLED	.09
		...MECHANICALLY INCLINED	-.09
		...SCIENTIFIC	1.03
I .40	...	INTELLIGENT	.09
		...STUDIOUS	.69
		...CREATIVE	.09
A -.03	...	IMAGINATIVE	.47
		...TALENTED	-.66
		...IMPORTANT	-1.59
S -.47	...	INFLUENTIAL	-1.41
		...HELPFUL	1.59
		...AMBITIOUS	.66
E -.40	...	AGGRESSIVE	-1.03
		...A LEADER	-.84
		...PRECISE	1.78
C 1.47	...	MATHEMATICAL	1.41
		...METHODICAL	1.22



TRIAD MEANS	DCI SCALE	ADJUSTED SCALE VALUE

HIGHEST TRAITS: PRECISE HELPFUL MATHEMATICAL METHODICAL

BEST MATCHED OCCUPATION GROUPS WITH ANALYSIS SUMMARY:

NAME:	MATHEMATICS	CHEMISTRY	FOREIGN LANGUAGES	HISTORY
SSD:	14.31	22.91	24.99	27.90
MEAN:	.79	1.27	1.39	1.55
SQ RT:	.8916	1.1283	1.1782	1.2451